

1. Why don't noble gases react?
It is believed that the reason noble gases do not react is because they have a stable octet of electrons. That is, the outermost orbit has 8 valence electrons.
2. Helium does not have an octet of electrons yet it is placed in group 18. Why?
Helium is placed in group 18 because it too does not react with other elements. It has the similar properties to the other elements in its group. The two valence electrons constitute a full outer orbit (something similar to the full octet).
3. Which of the atomic particles are believed to be responsible for how atoms behave in a chemical reaction?
The valence electrons are believed to be responsible for how atoms behave in a chemical reaction.
4. What are Lewis symbols?
Lewis symbols are a short-hand notation of representing the Bohr atom. Lewis symbols only show the valence electrons (as dots).
5. Answer p. 35 #2, 3, 4, 5, 7
*#2 – Atoms have a tendency to form ions in order to achieve the stable octet. Metals form cations (positive ions) while non-metals form anions (negative ions).
#3 – Metals and non-metals form ionic bonds. The metal transfers electrons to the non-metal. In doing so, the metal forms a cation and the non-metal forms the anion.
#4 – See the chart on the previous worksheet for answers.
#5 – H^{1+} K^{1+} F^{1-} Mg^{2+} S^{2-}
#7 – Follow the method outlined in today's class.*
6. What is a crystal lattice?
Look up the definition in your notes.
7. Please note that we drew the crystal lattice as cubic in shape. Next time you look at a table salt crystal, you should notice that they are cubic in shape! But just to let you know, not all ionic compounds form crystal lattices that are cubic in shape.
 - (a) Explain why ionic solids cannot conduct electricity.
Even though the solid is made up of ions, these ions are held together in place by strong attractive forces. Since the ions cannot move, there cannot be any flow of electric charge (which is what an electric current is).
 - (b) Explain why ionic liquids will conduct electricity
Particles in the liquid state can move freely. The ions, unlike in the solid state, are now free to move. If the ions are free to move, then they can conduct electricity.
 - (c) Explain why soluble ionic compounds will conduct electricity
Soluble ionic compounds are capable of conducting electricity because, when the ionic compound dissolves in water, it actually dissociates, that is, breaks up into ions that are free to move around in solution.
8. What evidence suggests that the force of attraction in an ionic bond is strong?
The evidence that suggests that the ionic bond is strong is the fact that ionic substances have very high melting points. It is very difficult to get the crystal lattice to break apart into "free flowing" ions.
9. A property of ionic solids is that they are brittle. How do we explain this?
When pressure is placed upon the crystal lattice, a sudden shift in layers places anions next to anions and cations next to cations – repulsion occurs and the lattice cleaves.
10. Can the Bohr model illustrate how ions are formed?
Yes. With the concept of ionization energies and electron affinities, it can explain why metals like to form cations and why non-metals prefer to form anions.
11. Can the Bohr model explain the ratio in which atoms unite to form ionic compounds?
You betcha for sure!! When we drew the Bohr atoms to show the transfer of electrons between metal/non-metal, we arrived at situations where all atoms were "happy". The number of atoms used was equal to the formula of the ionic compound.